

FROM		DATE	
CH/PPBS/IEG		21 Jan. 70	
TO	INITIALS	DATE	REMARKS
DIRECTOR			
DEP/DIRECTOR			
EXEC/DIRECTOR			
SPECIAL ASST			
ASST TO DIR			
ASST TO DEP/DIR			
CH/PPBS			
DEP CH/PPBS			
EO/PPBS			
CH/IEG	1	21 Jan 70	
DEP CH/IEG			
EO/IEG			
CH/PSG			DCI/REP <u>P</u> DCI/SPB <u>—</u> [Redacted] <u>MAH</u> This improves case for pending expansion test - <u>Ull</u>
DEP CH/PSG			
EO/PSG			
CH/TSSG/RED	2	21 Jan 70	
DEP CH/TSSG			
EO/TSSG			
CH/SSD/TSSG			
PERSONNEL			
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RECORDS MGT			
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DIR/IAS/DDI			
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CH/DIAAP-9			
CH/SPAD			

50037

IEG/24-70
21 January 1970

MEMORANDUM FOR: Chief, Research and Engineering Division, TSSG

ATTENTION: [REDACTED]

SUBJECT: Modification of [REDACTED] Fiber Optic Viewer

REFERENCE: [REDACTED] Special Study Report Covering
Inspection of 552A-01

1. One of the discarded P.I. Fiber Optic Viewers was transferred to PHD with the idea it might be modified to perform as a comparator. Its basic design is similar to the Point Transfer Device, a PHD measuring instrument. [REDACTED] was tasked to appraise the condition of the FOV and recommend what action should be taken. [REDACTED] found the viewer in such poor condition that it could not properly check its performance. In conformance with the [REDACTED] conclusions, a recommendation (IEG/PHD-32-69, 20 Feb. 1969) was submitted to TSSG to have [REDACTED] place the FOV in original condition. This was followed by verbal confirmation to [REDACTED] on TSSG's proposed action on 10 April 1969 (MR-IEG/PHD-51-69). Specifications for modification of the FOV were provided TSSG on 6 August 1969 (IEG/PHD-137-69). As a result, TSSG contracted with [REDACTED] to examine the viewer and submit a report on the existing alignment condition and feasibility of increasing its measuring accuracy to meet PHD requirements. The reference report and accompanying proposal were received 12 January 1970.

2. [REDACTED] estimated cost to modify and rework the instrument to provide + 2.5 micrometer accuracy in accordance to our specifications is [REDACTED]. This would require 16 - 20 weeks time to accomplish. They estimate [REDACTED] to produce a + 1 micrometer accuracy.

3. Since the initial request in February 1969, PHD has gained considerable experience from the Point Transfer Device, a measuring instrument of similar design to the FOV. This experience has surfaced a number of serious problems with the [REDACTED] design.

X1 SUBJECT: Modification of [] Fiber Optic Viewer

X1 These include: (1) periodic replacement of the fiber optic cables at a cost of approximately [] (2) rough or vibratory movement of the stages; and (3) distortion of the film by heat from the high intensity light source. Other difficulties, not fully defined, have also been experienced. The instrument is a fairly complicated one and has required considerable, frequent adjustment and maintenance, i.e., 21 malfunctions occurred between January 1 and January 20, 1970.

X1 4. Recently specifications of a [] stereocomparator have been reviewed. The design of this instrument is much simpler than the [] FOV. Its cost is [], including the electronic readout module. The [] readout module for the FOV will have to be replaced at a cost of approximately [] which would mean a minimum of [] to modify the FOV. Action is proceeding to contract for purchase of a [] 740A stereocomparator. 25X 25X 25X

X1 5. Based upon the many questionable factors associated with the FOV in achieving a reliable, accurate measuring instrument by modification it has been decided not to proceed further. The problems encountered with the PTD, the short life span of the fiber optic cables, the complexity of design, the high modification cost and the undependable service rendered by [] (as evidenced in the length of time required to complete the inspection) all discourage further consideration of modifying the FOV. The simplicity of design, the trouble free performance of existing [] instruments and the unequalled maintenance service record of the [] substantiate the decision. 25X 25X 25X

[]
Chief, Imagery Exploitation Group
NPIC 25X

Attachments:

1. IEG/PHD-32-69
2. IEG/PHD-51-69
3. IEG/PHD-137-69

Distribution:

- Orig. & 1 - RED/TSSG/NPIC
1 - OD/IEG/NPIC
2 - IEG/NPIC
2 - PHD/IEG/NPIC

ISG/DND-32-69
20 February 1969

MEMORANDUM FOR: Chief, Technical Services & Support Group, NPIC

ATTENTION: [REDACTED] ISG/DND

THROUGH: Chief, Imagery Exploitation Group, NPIC

SUBJECT: Improving Measuring Accuracy of the [REDACTED]
Stereo Viewer

REFERENCE: [REDACTED] Report on Evaluation of Scale Error and
Orthogonality of the [REDACTED] Stereo Viewer

1. While the [REDACTED] study and report are very well done and supply excellent information, it is believed that the recommended procedure is not in the best interest of PHD. Past experience in attempting to correct for errors by programming "adjustment equations" and "correction grids" indicate that these are more expensive and less reliable than mechanical improvements made to the instrument.

2. PHD recommends that:

- a. The instrument be cleaned, adjusted and repaired to its original performance level. This may eliminate the drift and stuttering conditions. It may also eliminate the variable focus problem and improve the non-orthogonality situation. It is agreed, as stated in the report, that no sound judgment can be made as to the best means to improve the accuracy of the instrument until its optimum performance in its present configuration is determined. Any measurement correction procedure is worth very little until the secular and periodic errors of the screws are known. As stated in [REDACTED] report, no firm data on these errors are possible with the instrument in its present condition.
- b. After the above has been accomplished, a full investigation should be made of the error characteristics as is briefly outlined in the first paragraph of Section VI (3)(c) of referenced report.

IEG/PHD-32-69

SUBJECT: Improving Measuring Accuracy of the [] Stereo Viewer

25X

3. Once the error characteristics of the instrument in its present form are determined, then a decision can be made to pursue one of the following courses of action:

- a. Use the instrument as is with additional adjusting of motions, orthogonality, etc.
- b. Install correction cams and slots on present lead screws.
- c. Install better lead screws. (The lead screws of the Point Transfer Device operate satisfactorily).
- d. Install a laser interferometer measurement system [] has made suggestions that they could do this).

X1

[]
Deputy Chief, Photogrammetry Division, IEG/NPIC

25X

Distribution:

- Orig. & 1 - NPIC/TSSG
1 - NPIC/IEG
1 - NPIC/IEG/OSS
2 - NPIC/IEG/PHD

NPIC/IEG/PHD [] 20 Feb. 69)

X1

IEG/PHD-51-69

10 April 1969

MEMORANDUM FOR THE RECORD

SUBJECT: Fiber Optics Viewer

REF: IEG/PHD-32-69

X1 1. [] TSSG, called to affirm our approval for
X1 him to proceed in getting the PHD fiber optic viewer in acceptable
working order. In response to the alternatives in the []
report, PHD recommended [] clean, adjust, and repair
the instrument to its original performance level, then an investi-
gation be made of the error characteristics and a decision reached
as to further corrective action necessary. 25X

X1 2. [] stated his proposed action was to forward a
X1 copy of the [] report to [] They would review
their files for performance and test data on the instrument, then
visit NPIC to examine the instrument, after which they would advise
us of their recommendation. NPIC then could request a proposal
from [] for the necessary modification. 25X

X1 3. I agreed to this procedure.

[]
Chief, Photogrammetry Division, IEG/NPIC 25X

Distribution:

1 - NPIC/IEG/OSS

✓ 1 - PHD/files

CONFIDENTIAL

Attach. 3

IEG/PHD-137-69
6 Aug 1969

MEMORANDUM FOR: Chief, Development & Engineering Division, TSSG

ATTENTION:

SUBJECT: Specifications for Modification of Fibre Optics
Viewer

1. To make the Fibre Optics Viewer capable of meeting PHD standards and compatible with other mensuration instruments the following specifications should be achieved:

- a. One (1) micrometer least count.
- b. A precision of 2.5 micrometers plus 0.005 percent of distance traveled.

2. Request these specifications be included in any contract for modification of the instrument for PHD's use in mensuration.

Chief, Photogrammetry Division, IEG
NPIC

Distribution:

- Orig. & 1 - NPIC/TSSG/DED
1 - NPIC/IEG/OSS
2 - NPIC/IEG/PHD

NPIC/IEG/PHD/ 6 Aug. 69)